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10/789,401	02/27/2004	Jeffrey Wannamaker	007412.00200	5238

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EXAMINER
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DAO, THUY CHAN

ART UNIT	PAPER NUMBER
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2192

MAIL DATE	DELIVERY MODE
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11/03/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/789,401	<b>Applicant(s)</b> WANNAMAKER ET AL.	
	<b>Examiner</b> Thuy Dao	<b>Art Unit</b> 2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-7,10-13,34-41 and 43-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-7,10-13,34-41 and 43-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. This action is responsive to the amendment filed on July 23, 2009.
2. Claims 1, 3, 5-7, 10-13, 34-41, and 43-48 have been examined.

### Response to Amendments

3. In the instant amendment, claims 1, 35, 36, 41, and 43 have been amended; and claims 44-48 have been added.
4. The objection to the claims is withdrawn in view of Applicant's arguments.

### Response to Arguments

5. Claims 34 and 43 are objected to because of minor informalities.

#### Claim 34:

In line 2, the phrase is considered to read as - *-of the p-code methods-* -.

#### Claim 43:

In line 4, the phrase is considered to read as - *-of the p-code methods-* -.

Appropriate correction is requested.

### Response to Arguments

6. Applicants' arguments have been considered.

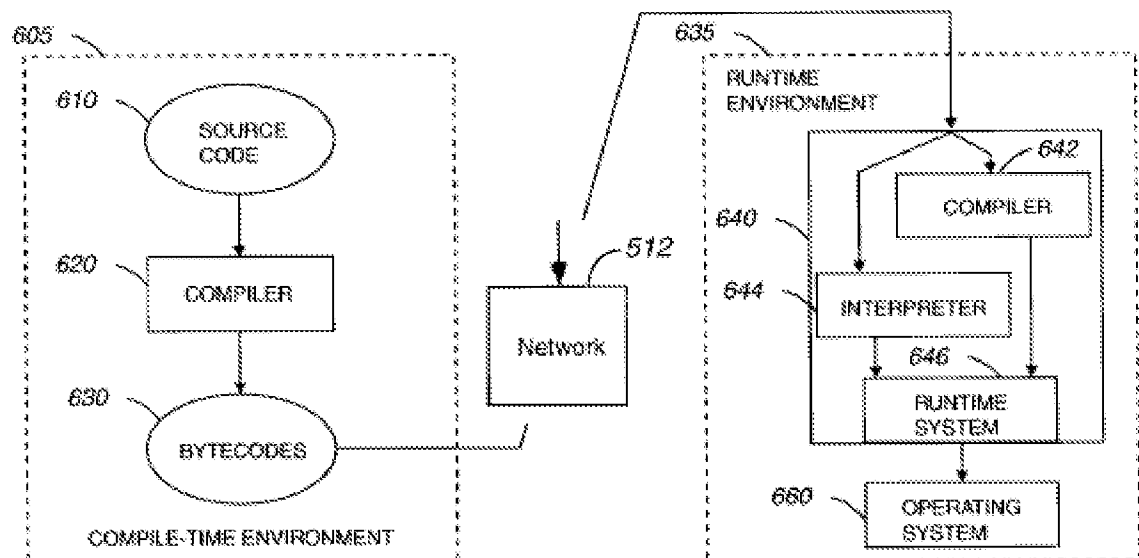
#### A. Comments on Claims 1 and 35:

Limitations at issue "*communicating the p-code file via a network to a target environment for execution of the compiled code and interpretation of uncompiled instructions in the p-code file*" (Remark, pp. 9-12).

As an initial matter, examiner notes that Applicants acknowledged Holze discloses Byte codes 630 and runtime environment 635 including Compiler 642 and Interpreter 644 (Remarks, page 10). Examiner further would like to direct Applicants' attention to FIG. 5:

"Byte codes 630 may generally be reproduced, downloaded, or otherwise distributed through a network, e.g., network 512 of FIG. 5, or stored on a storage device such as primary storage 534 of FIG. 5..." (col.11: 38-42, emphasis added).

Accordingly, Holzle explicitly discloses "*communicating the p-code file via a network to a target environment for execution of the compiled code and interpretation of uncompiled instructions in the p-code file*" (FIG. 5 and 6, distributing/communicating Byte codes 630 via Network 512 to runtime environment 635 for execution by Runtime System 646 and interpretation by Interpreter 644).



annotated/combined Figures 5 and 6

In page 11, Applicants further asserted that:

Moreover, after Holzle executes the instructions, it discards them, so there is definitely no teaching in Holzle for communicating them in a p-code file via a network, as recited. Holzle indicates that in "general, the machine-language instructions are discarded when virtual machine 640 terminates" (*id.* at C12, L7-8; emphasis added); and hence virtual machine 640 is

Examiner notes that "...the machine-language instructions are discarded when virtual machine 640 terminates". That is to say, before terminating its operation, the virtual machine still receives Byte codes 639 distributed/communicated via Network 512.

B. Comments on Claims 10 and 39 (Remarks, page 12):

Examiner respectfully directs Applicants' assertions to:

"Each time a method is invoked, if the method is not compiled, byte codes 144 associated with the method are interpreted using interpreter 148. In one embodiment, a measure of how many times a method is interpreted is maintained. Such measures may include a counter, e.g., an invocation counter, which is included in each interpreted method..." (col.4: 41-48, emphasis added, invocation counter using unused flag/bits in said interpreted method); and

"An execution list, as mentioned above, is a queue of methods, or a candidate set of methods, which is created during the current execution of the program. ... The execution list may also identify methods which were periodically added to the list by a separate sweeper process which studies the invocation counters, i.e., counters which track the number of times a method has been interpreted, associated with interpreted methods. In general, the invocation counter for a method is incremented each time the method is invoked. The sweeper may periodically study invocation counters to determine if invocation counters of methods which have not been recently invoked are at a level which is currently considered to deem the method as appropriate for compilation..." (col.6: 53-65, emphasis added, invocation counter using unused flag/bits in said interpreted method).

C. The Remaining Pending Claims (Remarks, page 12):

These claims are also rejected based on virtue of their dependencies on the rejected base claims 1 and 35.

D. New Claims (Remarks, pp. 12-13):

These claims are also rejected because they recite the same limitations as in claims 1 and 35.

**Claim Rejections – 35 USC §103**

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 3, 6, 7, 10-13, 35, 37-41, and 44-47 are rejected under 35 U.S.C. 103(a) as being anticipated by Holzle (art of record, US Patent No. 6,240,548) in view of Beadle (art of record, US Patent No. 6,530,075).

**Claim 1:**

Holzle discloses *a method for processing a p-code file, comprising:*

*analyzing p-code methods within said p-code file by a computer to determine a resource utilization for the p-code methods (e.g., FIG. 1, col.4: 20 – col.5: 19);*

*identifying one or more p-code methods that have a resource utilization parameter above a threshold level (e.g., FIG. 3, blocks 302-306, col.7: 12-67); and*

*annotating said identified p-code methods to be compiled (e.g., FIG. 4, col.10: 4-44; col.12: 14-61; col.6: 21 – col.7: 21),*

*said annotating comprising a priority level hint for each annotated p-code method (e.g., col.2: 57-62, col.8: 66 – col.9: 20),*

*said priority level hints being hierarchically-related and collectively representing a hierarchical order (e.g., FIG. 4, blocks 404 or 406, col.10: 4-44; col.4: 4 – col.5: 30),*

*said priority level hints enabling preferential processing of said p-code methods in a hierarchical manner corresponding to said hierarchical order of said priority level hints (e.g., FIG. 6, col.11: 26 – col.12: 12; col.7: 23 - col.8: 39; col.2: 23 - col.3: 8);*

*replacing one or more lines of instructions in the p-code file with compiled code for the identified p-code methods (e.g., FIG. 3, block 306 “Begin Compilation of Highest Priority Method); and*

*communicating the p-code file via a network to a target environment (e.g., FIG. 5, Network 512, col.11: 38-42)*

*for execution of the compiled code and interpretation of uncompiled instructions in the p-code file (e.g., FIG. 6, Runtime System 646, Compiler 642, and Interpreter 644).*

Holzle does not explicitly disclose *inserting an in-line priority level hint for each annotated p-code method.*

However, in an analogous art, Beadle further discloses *inserting an in-line priority level hint for each annotated p-code method (e.g., FIG. 2A-C, keywords extensions such as OPTIMIZE\_INLINE, OPTIMIZE\_JIT for each Java class/method).*

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Beadle's teaching into Holzle's teaching. One would have been motivated to do so to optimize running of bytecode as suggested by Beadle (e.g., [0024] and [0089]).

### **Claim 3:**

Beadle further discloses *said p-code file comprises an application for processing by a virtual machine (VM) just-in-time (JIT) compiler (e.g., FIG. 2A-C and related text).*

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Beadle's teaching into Holzle's teaching. One would have been motivated to do so as set forth above.

**Claim 6:**

Holzle discloses *the method of claim 1, wherein: said resource utilization parameter comprises at least one of a method execution time, a frequency of method invocation, a number of instructions and a use of loop structures (e.g., col.8: 1-53; col.11: 26-65).*

**Claim 7:**

Holzle discloses *the method of claim 1, wherein: said resource utilization parameter comprises at least one of an execution time parameter, an input/output utilization parameter and a processor utilization parameter (e.g., col.4: 4 – col.5: 30; col.8: 41 – col.9: 36).*

**Claim 10:**

Holzle discloses *the method of claim 1, wherein: said annotating comprises selectively setting each of a plurality of normally unused bits within a method access flag field of an identified class file (e.g., col.7: 23 – col.8: 39; col.8: 1-53),*

*wherein said unused bits are selectively set to define thereby said priority level hint of a respective annotated method (e.g., col.6: 21 – col.7: 21; col.8: 41 – col.9: 36).*

**Claim 11:**

Holzle discloses *the method of claim 1, wherein: each identified p-code method is associated with one of a plurality of priority levels, said priority level hints being indicative of respective priority levels (e.g., col.2: 23 – col.3: 8; col.4: 4 – col.5: 30).*

**Claim 12:**



Holzle discloses *the method of claim 3, further comprising: selectively pre-compiling portions of said p-code file that are designated by the in-line hints* (e.g., col.7: 12-67; col.8: 66 – col.9: 63).

**Claim 13:**

Holzle discloses *the method of claim 12, wherein: said precompiled portion of said application file is included within a virtual machine* (e.g., col.11: 26 – col.12: 12; col.2: 23 – col.3: 8).

**Claims 35 and 37-41:**

Claims 35 and 37-41, which recite(s) the same limitations as those of claims 1, 3, 6, 7, 10-13, and 33, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claim(s), it also teaches all of the limitations of claims 35 and 37-41.

**Claims 44-47:**

Claims 44-47 are apparatus versions, which recite(s) the same limitations as those of claims 1 and 10-12, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claim(s), it also teaches all of the limitations of claims 44-47.

9. Claims 34, 43, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holzle in view of Beadle and Cierniak (art of record, US Patent No. 7,103,723).

**Claim 34:**

Cierniak discloses *the method of claim 1, further comprising managing storage of methods in a cache memory according to the hierarchical order* (e.g., col.1: 11 – col.2: 6; col.3: 2-31; col.6: 31-58).

**Claim 43:**

Claim 43, which recite(s) the same limitations as those of claim 34, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claim(s), it also teaches all of the limitations of claim 43.

**Claim 48:**

Claim 48 is an apparatus version, which recite(s) the same limitations as those of claim 34, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claim(s), it also teaches all of the limitations of claim 48.

10. Claims 5 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holzle in view of Beadle and US Patent Publication No. 2003/0149960 A1 to Inamdar (art made of record, hereafter Inamdar).

**Claim 5:**

Holzle does not explicitly disclose *the method of claim 1, further comprising providing said priority level hints are provided as a separate file.*

However, in an analogous art, Inamdar further discloses *providing said priority level hints are provided as a separate file* (e.g., FIG. 1, Source code 100, Compiled classes 102, and Instrumentation directives file 104 are separate files, [0036]-[0038]).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Inamdar's teaching into Holzle's teaching. One would have been motivated to do so to provide a flexible and extensible mechanism for injecting instrumentation code into compiled Java application as suggested by Inamdar (e.g., [0022]-[0029]).

**Claim 36:**

Claim 36, which recite(s) the same limitations as those of claim 5, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the

reference teaches all of the limitations of the above claim(s), it also teaches all of the limitations of claim 36.

### **Conclusion**

11. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication should be directed to examiner Thuy (Twee) Dao, whose telephone/fax numbers are (571) 272 8570 and (571) 273 8570, respectively. The examiner can normally be reached on every Tuesday, Thursday, and Friday from 6:00AM to 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam, can be reached at (571) 272 3695.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is (571) 272 2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For

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more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Twee Dao/

Examiner, Art Unit 2192

/Tuan Q. Dam/

Supervisory Patent Examiner, Art Unit 2192